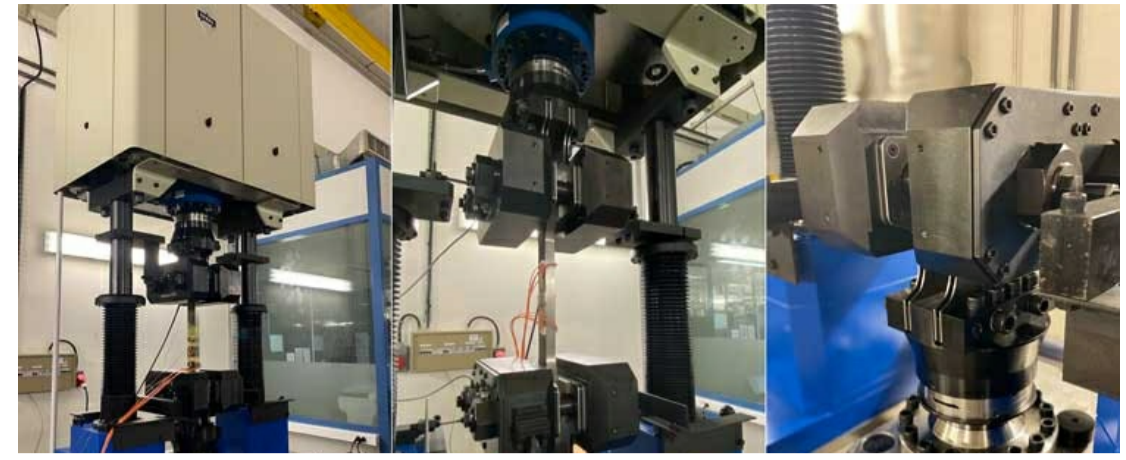


CHARACTERIZATION OF MATERIALS IN FATIGUE

High capacity 550 kN vibrophore to load your test specimens (maximum: 850mm) at frequencies of up to 150 Hz, reducing the overall testing time.



Your expectations

To validate the fatigue life of a part, the material must firstly be characterised on test specimens. The objective is to:

- Identify the behaviour laws of the material,
- Evaluate the endurance limit and plot the S/N curve (Wöhler curve),
- Compare the fatigue response of different manufacturing processes,
- Assess the potential drifts of your processes during the “series production”,
- Carry out fracture mechanics testing (K1C, da/dN, J1C, etc.)”

Our solutions

Comprehensive support from test definition to interpretation of results (behaviour laws for materials & test/calculation correlations)

To meet the needs of industrial manufacturers, Cetim has developed a distinctive approach allowing you to :

- Optimise the service time through a specific experimental plan and a test matrix that includes just the required tests offered by our experts,
- Characterise your materials at elevated temperatures (high-temperature cryogenics) and in harsh environments.
- Correlate the test data to the calculation data using contactless methods (e.g.: correlation of digital images) and/or instrumentation.
- Develop specific test methodologies, such as composite materials,
- Train you on material fatigue phenomena with our complete [Cetim Academy®](#) training offer

ZOOM ON HYDROGEN

[HyMEET](#), our technological platform dedicated to H2, provides mechanical engineering with resources and skills needed to master low-carbon hydrogen production, distribution, storage and utilization technologies. HyMEET combines an ambitious R&D program with a €25 million investment in resources dedicated to characterization and validation tests (up to 1000 bar and in a range of temperatures from deep cryogenics to high temperatures) as well as consulting and training.

Its activities are dedicated to:

- Characterizing the behavior of materials in contact with hydrogen
- Development of specific test methods
- Characterization of specific mechanical equipment and systems in severe hydrogen environments.

Our equipment enables:

Mechanical characterization of materials using fatigue machines in a high-pressure hydrogen environment
Control of sealing systems and plant containment, with test benches developed to study gas diffusion phenomena, resistance to rapid decompression and sealing performance under severe conditions
The study of the ageing of test specimens in high-pressure autoclaves
Tests under cryogenic conditions for the use of hydrogen in liquid form, with several cryostats fed by a helium-hydrogen liquefier
Multiphysics tests with pressure, temperature and cycling.
Manufacture of thermoplastic composite parts (tanks, tubes) by in-situ deposition and consolidation (in real time, with no further steps required) using our HySPIDE TP robotized cell.

Our specific services dedicated to the characterisation of materials in fatigue:

Mechanical characterisation of materials in hydrogen environment (high pressure, gas mixtures and wide temperature range)
Wide range of mechanical fracture tests
Support in selecting and choosing compatible materials for H2 applications

Your benefits

A customised, proven methodology applicable to a wide range of materials (metallic and non-metallic) and processes (forming & assembly, etc.)
A unique range of machines providing support for significant volume of tests. Cetim has recently invested in a high capacity 550 kN vibrophore which can stress your specimens (maximum: 850mm) at frequencies up to 150 Hz, thus reducing the overall duration of tests
Our industrial expertise and cutting-edge resources enable us to carry out multiphysics tests under severe stresses.
Cofrac accredited testing (accreditation COFRAC No. 1-1014 - Scope available on www.cofrac.fr),
Advice from an independent experts to help you determine the best testing campaign to ensure your products reliability.



Question and Answer Service
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